

An Optical View of Interacting Radio Galaxies

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Text: Interactions play an important role in galaxy evolution. The turbulent motion of gas and dust enhanced by the gravitational influence of the galaxies on each other could lead to bursts of star formation and trigger accretion onto the supermassive black holes at the centres of the galaxies. In such cases, emission in the radio regime might originate in the starburst regions from supernova remnants, as well as from the active galactic nucleus (AGN). We study nine pairs of interacting galaxies using optical long-slit spectroscopy data obtained using the Multi Object Double Spectrograph at the Large Binocular Telescope. Extracting one-dimensional spectra from the central 1 arcsec of each of the galaxies, we plot optical diagnostic diagrams and place them in the context of their corresponding radio detections in the FIRST survey as well as observations at 4.85 GHz using the Effelsberg radio telescope. We find that for interacting groups in the post first passage stage, the line ratios of the centres of the galaxies associated with FIRST detections fall in the transition/composite region of the diagnostic diagram. In contrast, the line ratios of the galaxies that are yet to have a first passage fall in the star-forming region of the diagnostic diagram. This plus the presence of galaxies with high values of radio loudness, as well as galaxies with broad emission line components detected in their optical spectra, in the transition/composite region of the diagnostic diagram leads us to speculate that there must be some contribution by obscured AGN to the emission from these galaxies. The radio loud phase might then play an important role, perhaps in getting rid of the obscuring material.